

Hepatitis

Hepatitis is an inflammation of the liver. It has both infectious and noninfectious (amebic and alcoholic, for example) causes. For purposes of this chapter, hepatitis refers to those types that are notifiable and considered a public health threat. These include hepatitis A, hepatitis B, hepatitis C, hepatitis Non-A Non-B, and hepatitis unspecified.

Hepatitis has been recognized as a specific and infectious disease for centuries. Two types of hepatitis were identified early on: the type which caused large epidemics and spread from person to person, hepatitis A, and the type which could be transmitted by exposure to blood, hepatitis B. Human volunteer studies conducted in the 1940s and 1950s identified more specifically the viral origins of these two types, how they are transmitted, and how long immunity resulting from infection lasts.¹ As the development and availability of sensitive and specific testing options increased, the alphabet of hepatitis progressed from A through G.

Hepatitis A is transmitted by the fecal-oral route. Symptoms usually appear suddenly and include fever, malaise, anorexia, nausea, abdominal discomfort, dark urine, and jaundice.² Children under 6 who get the disease usually have milder, more nonspecific symptoms than do adults. Only 10% of children aged 4 to 6 experience jaundice.¹ The incubation period may be as long as fifty or as short as fifteen days, but on average is 28 to 30 days. Hepatitis A virus (HAV) is not thought to cause a chronic or carrier state of disease. HAV is a significant concern when a case is diagnosed in a foodhandler, worker/enrollee in a daycare center, or resident/employee of an institution that cares for handicapped persons. Poor handwashing habits can turn a single case into an outbreak situation. Other persons at risk for hepatitis A are 1) travelers to countries where HAV is common and clean water and proper sewage disposal are not available and 2) persons who eat raw or undercooked shellfish such as oysters or clams.²

Hepatitis B virus (HBV) is transmitted through contact with blood or body fluids. Transfusion of blood or blood products, sharing needles, tattoos, hemodialysis, and sexual contact are known means to spread the virus. In about 35% of cases, the transmission source cannot be identified. The average incubation period is 60 to 90 days although it may be as long as 180 days. A chronic carrier state does exist with HBV and the chances of becoming a carrier decrease with age at time of occurrence. An infant infected at birth may have as much as a 90% chance of chronic infection while a person becoming ill as an adult may have a 10% chance or less.²

Hepatitis C (HCV) is also transmitted through contact with blood. Sexual transmission and transmission from mother to child do not appear to occur as frequently as with HBV. However, if a mother is co-infected with HIV, risk of transmission to the baby at birth may increase.³ In over 40% of cases, the risk factors for disease cannot be determined. Symptoms, when they occur (up to 90% may be asymptomatic),³ include fatigue, jaundice, loss of appetite, abdominal pain, nausea, and vomiting. The incubation period ranges from 15 to 150 days. Hepatitis C has a significant public health impact both in regard to health and finances.

Hepatitis D (HDV) infection only occurs in conjunction with hepatitis B infection.⁴ The infection may occur simultaneously with HBV or it may occur in chronic carriers of HBV. Symptoms are the same as for HBV but are generally more severe in nature even in children. The incubation period is 2 to 8 weeks. The disease may be chronic.²

Hepatitis E virus (HEV) has attributes similar to those of HAV. It is thought to be transmitted by the fecal-oral route. It is known to be transmitted through contaminated water. Large outbreaks/epidemics have been reported in Burma, Iran, Bangladesh, Mexico, Indonesia, and China. The average incubation period of 26 to 42 days is slightly longer than that of HAV. The primary difference between HAV and HEV is the increased chance of death that accompanies HEV infection in pregnant women. The fatality rate of women infected during the third trimester of pregnancy may reach as high as 20%.²

Researchers in India, France, England, and Italy have reported illnesses caused by hepatitis F virus.⁵ However, little is known about the virus and no study has confirmed these findings.⁶

The newest member of the hepatitis alphabet is hepatitis G (HGV). The virus is still under study. It is thought to be transmitted via the blood-borne route. Symptoms appear to be mild and jaundice is absent in most cases. It is thought to be closely related to hepatitis C as approximately 10% to 15% of patients with chronic HCV infection also have HGV RNA (ribonucleic acid) in their serum.⁷ The CDC estimates 900 to 2,000 infections per year in the U.S. and that chronic infection develops in 90% to 100% of infected persons.⁸

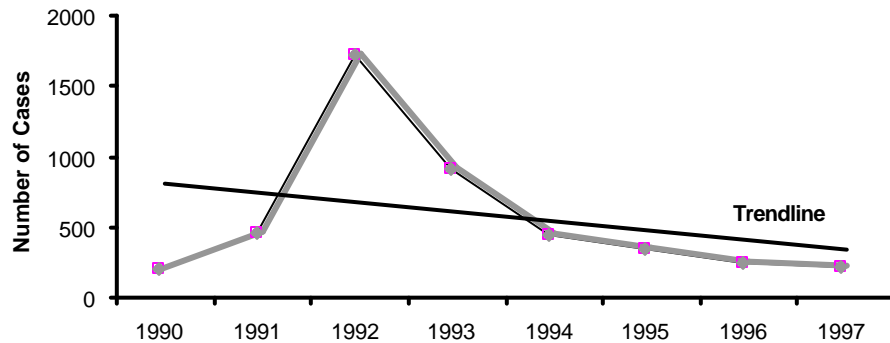
Hepatitis NonANonB (NANB) is no longer a reportable classification of hepatitis in Tennessee. Basically, this diagnosis was one of exclusion. Prior to 1989 it was known that some type of hepatitis other than A or B was causing illness. Because there was no specific test available to identify the virus, after hepatitis A and B were excluded the diagnosis was NonANonB hepatitis. In 1989, the virus that caused the previously unknown hepatitis was identified. A viral antibody test became available in 1990.⁹ The newly identified virus was named hepatitis C.

Trend

A total of 4,616 cases of hepatitis have been reported in Davidson County from 1990 through 1997, an average of 577 cases per year. This total includes hepatitis A, hepatitis B, hepatitis C, hepatitis NonANonB, and hepatitis unspecified. **(It is important to note** when examining the data for hepatitis that the contents of the category varied during the period under study as the reporting requirements changed and the availability of testing for hepatitis C became available. Hepatitis A, B, and NonANonB are included in the totals for years 1990 through and including 1996. In 1992, one hundred twenty-nine cases were reported as hepatitis unspecified. The totals for years 1996 and 1997 include cases of hepatitis C.) Reported cases of hepatitis doubled from 1990 through 1991 and tripled from 1991 through 1992 to the high of 1,727 cases. For each of the next two years the number of reported cases was almost one half of the number reported the previous year. The trend has been decreasing yearly since 1992.

The 229 cases reported in 1997 are only 13 cases more than were reported in 1990, the year of fewest reported cases. See figure 9.

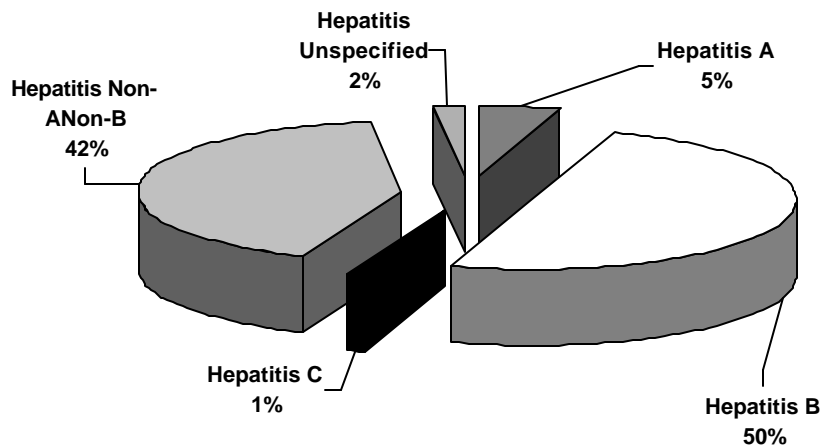
Figure 9 : Reported Hepatitis* Cases, Davidson County, Tennessee, 1990 - 1997



*Includes Hepatitis A, B, and Non-ANon-B for years 1990 through 1996; 1992 includes Hepatitis Unspecified; 1996 and 1997 include Hepatitis C

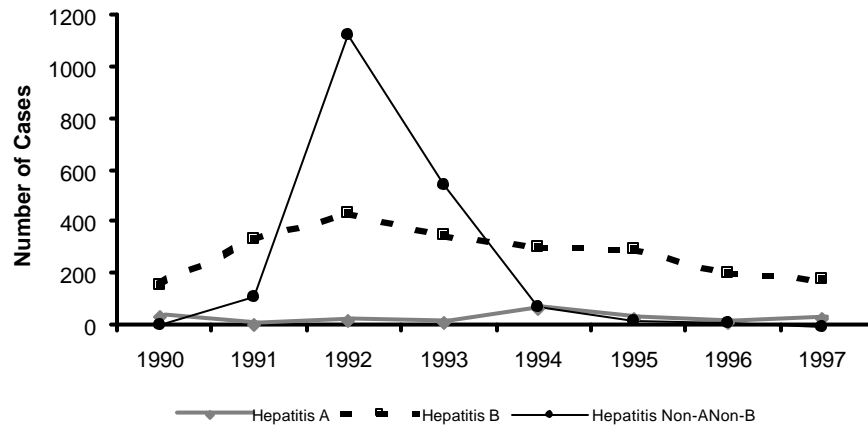
Figure 10 breaks out the role of each type of hepatitis in the yearly total.

Figure 10 : Percent of Reported Hepatitis Cases by Type, Davidson County, Tennessee 1990 - 1997



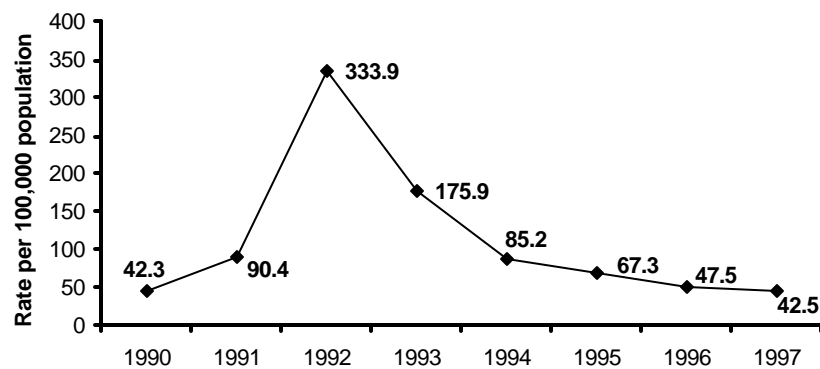
Hepatitis A, B, and NonANonB comprise the majority of the reported hepatitis cases. Figure 11 examines the fluctuation in numbers of reported cases for these three diseases during the eight years examined. The number of reported cases of HAV ranged between five and sixty-eight. Hepatitis NonANonB and hepatitis B, to a lesser extent, showed an increase in reported cases in 1992 followed by a continual decline. The decline for reported NANB was dramatic while the decline for HBV was more gradual.

Figure 11 : Comparison of Reported Cases of Hepatitis A, B, and NonANonB, Davidson County, Tennessee 1990 - 1997



Incidence per 100,000 population is seen in figure 12. Rates in 1990 and 1997 are almost identical. The rate of 333.9 per 100,000 population seen in 1992 is the highest of the years examined.

Figure 12 : Incidence Rate of Reported Hepatitis* Cases, Davidson County, Tennessee, 1990 - 1997



*Includes Hepatitis A, B and NANB in 1990 through 1996; Hepatitis Unspecified in 1992; and Hepatitis C in 1996 and 1997

The incidence of Hepatitis A peaked at 12.9 per 100,000 population in 1994. See figure 13.

Figure 13 : Incidence Rate of Reported Hepatitis A Cases, Davidson County, Tennessee, 1990 - 1997

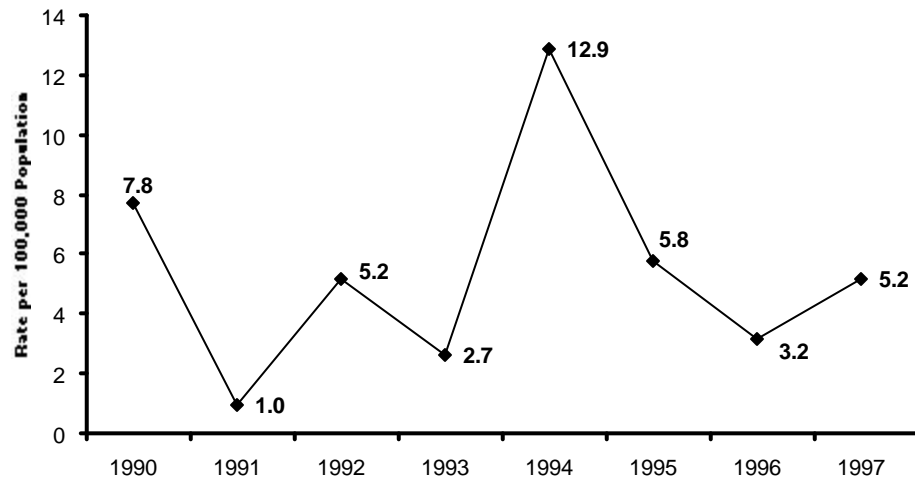
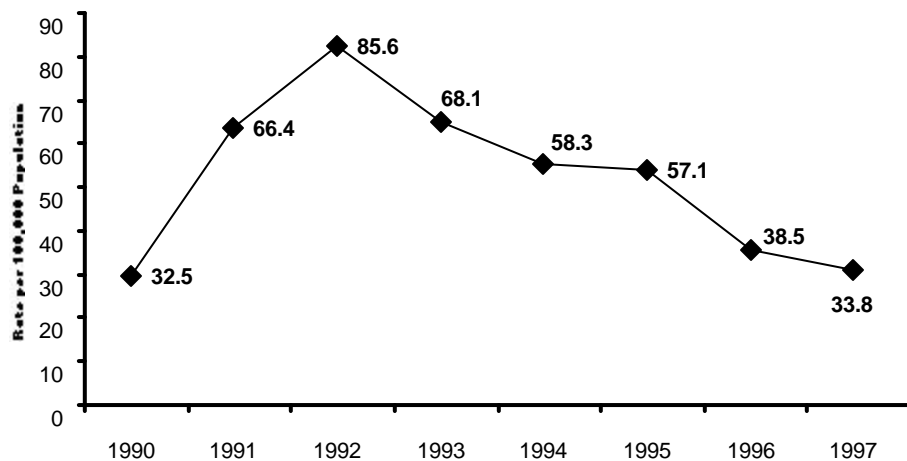


Figure 14 points out that the incidence of hepatitis B peaked at 85.6 cases per 100,000 population in 1992.

Figure 14 : Incidence Rate of Reported Hepatitis B Cases, Davidson County, Tennessee, 1990 - 1997



Who had more reported cases of hepatitis in Davidson County?

Hepatitis reported in Davidson County from 1990 through 1997 occurred most often in persons who were:

- Between the ages of twenty and forty-nine.
- Male.

Age

Hepatitis significantly impacts persons between the ages of twenty to forty-nine. Eighty-one percent of cases for which age information was available were in this age group. See figures 15 - 19. This observation holds true for each type of hepatitis. It is most obvious in NANB and HCV, where 90% of all reported cases fell within the ages of twenty to fifty. Children and teenagers were more likely to be infected with HAV. Three to five percent of cases of each type of hepatitis were in persons over sixty years of age.

Figure 15 : Reported Hepatitis Cases by Age, Davidson County, Tennessee, 1990 - 1997

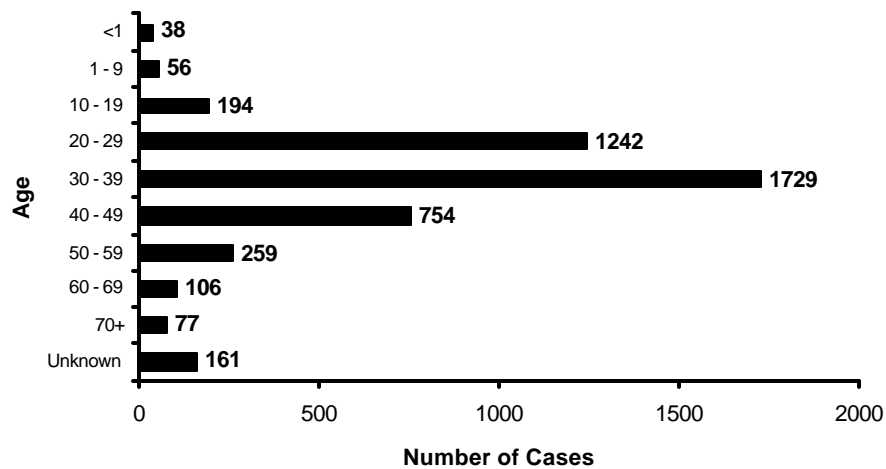
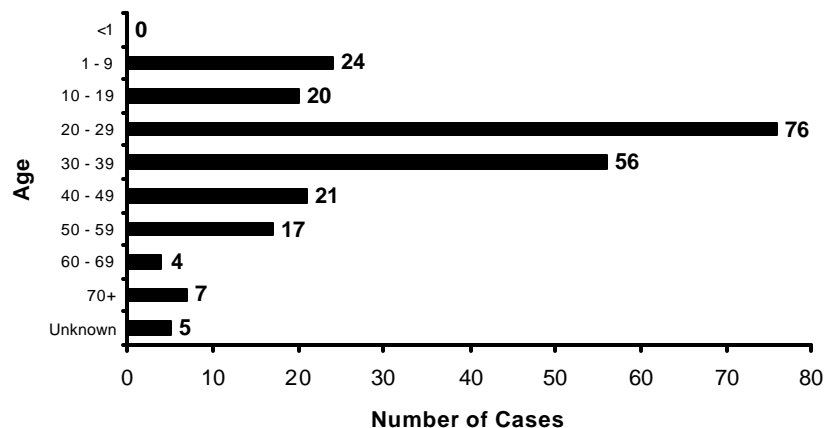
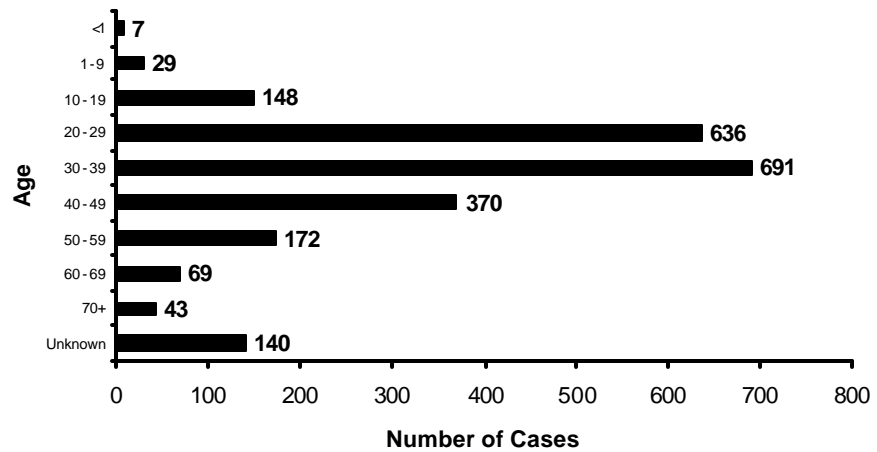


Figure 16 : Reported Hepatitis A Cases by Age, Davidson County, Tennessee, 1990 - 1997



**Figure 17 : Reported Hepatitis B Cases by Age,
Davidson County, Tennessee, 1990 - 1997**



**Figure 18 : Reported Hepatitis C Cases by Age
Davidson County, Tennessee, 1996 - 1997**

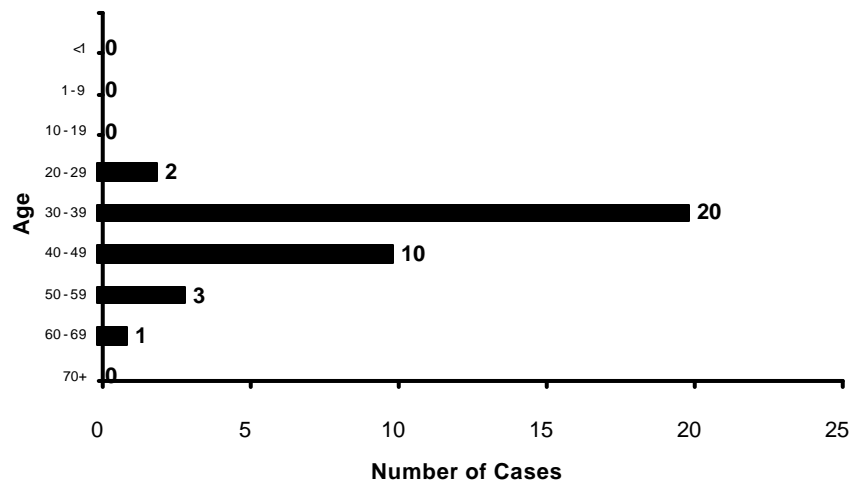
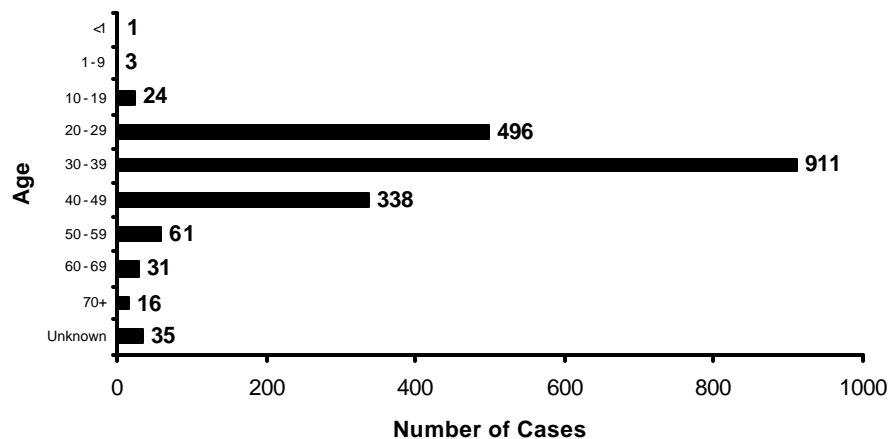


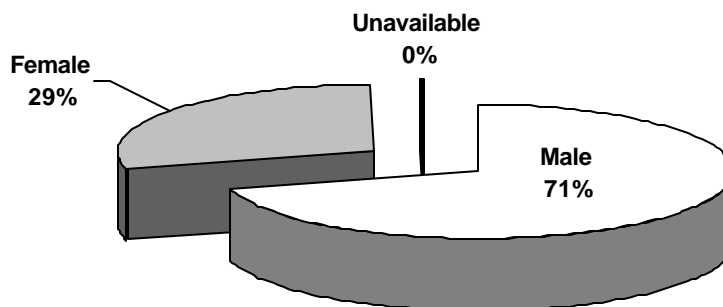
Figure 19 : Reported Hepatitis NonANonB Cases by Age, Davidson County, Tennessee, 1990 -1996



Gender

The reported hepatitis cases were predominantly male. Males were reported with hepatitis at greater than twice the frequency of females. This was true with each type of hepatitis except for HCV. The reported cases of hepatitis C were almost evenly divided between males and females. See figure 20.

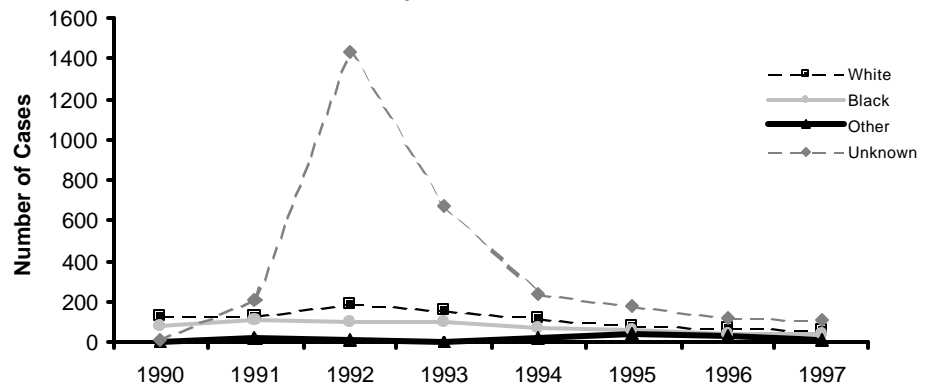
Figure 20 : Percent of Reported Hepatitis Cases by Gender, Davidson County, Tennessee, 1990 - 1997



Race

Race information was not available in 2,971 (64%) of the reported cases of hepatitis. Over one half of the remaining 1,645 cases were of the white race. Fewer than 10% were of other races and the remainder were of the black race. The rankings hold true when examining each type of hepatitis. Refer to figure 21. Table 3 presents the numbers of reported cases of hepatitis by race and gender.

**Figure 21 : Reported Hepatitis Cases* by Race
Davidson County, Tennessee, 1990 - 1997**



*Includes Hepatitis A, B, NonANonB in 1990 through 1996; Hepatitis Unspecified in 1992; and Hepatitis C in 1996 and 1997

Table 3 : Reported Cases of Hepatitis by Gender and Race*, Davidson County, Tennessee, 1990 - 1997

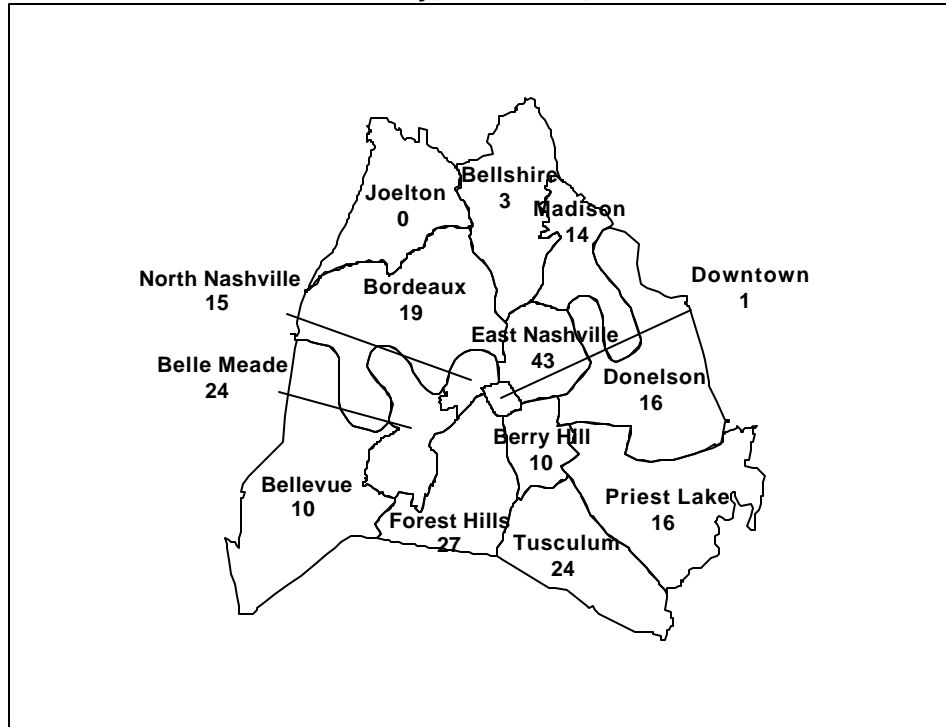
Year	All Races			White			Black			Other			Unknown		
	All	Male	Female	All	Male	Female	All	Male	Female	All	Male	Female	All	Male	Female
1997	229	150	78	64	43	21	43	26	17	10	6	4	111	75	36
1996	254	159	94	68	45	23	38	27	11	29	16	13	119	71	47
1995	358	222	136	83	55	28	61	44	17	36	21	15	178	102	76
1994	450	295	155	122	79	43	74	35	39	15	6	9	239	175	64
1993	919	650	269	154	95	59	94	72	22	0	0	0	671	483	188
1992	1,727	1,317	404	190	105	84	94	60	34	14	8	6	1,429	1,144	280
1991	463	340	116	126	88	38	105	67	38	23	15	8	209	170	32
1990	216	136	80	126	76	50	76	49	27	0	0	0	14	11	3
Total	4,616	3,269	1,332	933	586	346	585	380	205	127	72	55	2,971	2,231	726

* Not included : 1 case race and gender unknown, 14 cases gender unknown

Where were the most cases of hepatitis reported in Davidson County?

In 1997, the East Nashville/Inglewood community was the residence of 19% of all hepatitis cases reported. Following in frequency of reported cases were the Forest Hills/Oak Hill community (12%) and the BelleMeade/WestMeade and Tusculum/Crieve Hall communities (10%). See map 2. The East Nashville/Inglewood community led in number of both hepatitis B (20%) and hepatitis C (21%). However, the Forest Hills/Oak Hill community had the greatest number of reported cases of hepatitis A (25%).

Map 2 : Reported Cases of Hepatitis by Planning District*, Davidson County, Tennessee, 1997



* Davidson County is divided into 14 planning districts (see Technical Notes).

How does Davidson County rank within Tennessee in reported cases of hepatitis?

In 1997, Davidson County ranked second highest among the four large metropolitan areas in Tennessee for total reported hepatitis cases, second only to Memphis. Overall the hepatitis rate in Davidson County was twice as high as the rate for the state in 1997. Ranked by type of hepatitis, Davidson County was second for reported hepatitis A, first for reported hepatitis B, and second for reported hepatitis C. Of all reported hepatitis cases in Davidson County in 1997, 40% were hepatitis B. The rate of hepatitis B in Davidson County was three times as high as that of the state and twice as high as that of Shelby County. See table 4.

Table 4 : Comparison of Hepatitis Rates per 100,000 Population, 1997

	Davidson		Hamilton*		Knox*		Shelby*		Tennessee*	
Disease	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Hepatitis A	28	5.2	13	4.4	22	6	249	28.5	417	7.8
Hepatitis B	182	33.8	14	4.7	26	7.1	125	14.3	453	8.5
Hepatitis C	19	3.5	10	3.4	14	3.8	21	2.4	242	4.5
All Hepatitis	229	42.5	37	12.5	62	17	395	45.2	1,112	20.8

*Data from Assessment Information Manager (AIM), Tennessee Department of Health